EXPERIENCE WITH AN EMERGENCE TRAP FOR INSECTS BREEDING IN DEAD WOOD

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In an earlier article (Owen, 1989), I described a prototype device for trapping insects breeding in dead wood. This consisted of a plastic floor to which was fitted a detachable tent with a collecting head. The purpose of this follow-up note is to describe modifications to the design found necessary in four years of continuous operation and to present the results obtained from one sample of dead wood as an illustration of the trap's potential.

Modifications

Three main problems were encountered in operating the device. The first concerned the material used for the floor of the trap. The prototype was set up in the author's garden with the floor resting on short turf and loaded with dead wood. After 12 months' operation, the woven plastic material forming the floor was found to have sustained perforations, caused by weight of the dead wood and by plants forcing their way through it. Because of this, the woven plastic material floor was replaced with the much tougher porous material 'Teram' (Imperial Chemical Industries). The latter proved entirely serviceable for the remainder of the study.

The second problem also concerned the floor. After two years of operation, the unevenness of the ground on which the trap was set, together with the weight of the dead wood within the device was causing the 'Velcro' junction between the tent and the floor to give way in places. This problem was solved by putting the whole trap on a firm wooden base which allowed the under strip of Velcro to be tacked down, providing a stable junction with the Velcro around the base of the tent.

The third problem encountered was deterioration of the terylene netting forming the tent so that it started going into holes on minimal trauma. This required a new tent to be constructed. The same type of material was used. This too was found to deteriorate during the second two-year period but not to the same extent as during the first two years. The deterioration of the netting was probably due to the siting of the whole trap in direct sunlight for similar material used for other purposes in shaded areas for up to five years showed little deterioration. The slower deterioration of the second tent may have been due to the lower amount of sunshine in the fourth year.

A related unexpected hazard arose when the author's family acquired two kittens who took a fancy to playing on the trap, subjecting the netting to minor tears. This required the whole device to be enclosed in a simple wire-netting frame.

Results

The trap was loaded in March 1988 with 10 oak logs from Windsor Great Park. These comprised portions of thick, dead branches which had been torn off during a storm in October 1987. The timber had lain on the ground where it fell until March 1988 when it was collected and placed in the trap, forming a triangular heap. Individual pieces were about 1200 mm long and about 150 mm in diameter. None had obvious rot holes but some had fungoid growth affecting the bark. Though the trap was in direct sunshine, the logs at the bottom of the heap were effectively shaded. The logs remained in the trap until August 1991.

An analysis of the catch is provided in Table 1. Over the four-year period, 353 beetles emerged from the dead wood involving 37 species. During the first year, the number of species emerging was very much greater than in subsequent years. While many of these beetles had almost certainly been breeding in the timber before it had broken away from the tree, some such *Chaetocnema* spp. and *Rhynchaenus* spp. were no doubt hibernating in the timber when it was picked up.

Table 1. Beetles from oak logs stored in emergence trap. The logs were portions of thick branches torn off by a storm in October 1987 (see text). They were picked up in March 1988 and placed in the trap where they remained until August 1991.

Species		No. of examples				
		1988	1989	1990	1991	total
Dromius quadrinotatus (Zenker)		1	–	–	–	1
Ptomaphagus subvillosus (Goeze)		1	–	–	–	1
Dropephylla ioptera (Steph.)		1	–	–	–	1
Quedius tristis (Grav.)		1	–	–	–	1
Tachyporus hypnorum (F.)		1	–	–	–	1
Gyrophaena affinis Mannerh.		1	–	–	–	1
Leptusa fumida Kraatz		1	–	–	–	1
Amischa analis (Grav.)		2	–	–	–	2
Phloeopora angustiformis Baudi		1	–	–	–	1
P. testacea (Mannerh.)		2	–	–	–	2
Agrilus laticornis (Ill.)		4	–	–	–	4
Stenagostus villosus (Fourc.)		–	–	–	4	4
Melasis buprestoides (L.)	AW13*	3	–	–	–	3
Xestobium rufovillosum (Deg.)	AW13	1	–	–	–	1
Ptinus palliatus Perris		–	1	–	–	1
P. sexpunctatus Panz.		1	–	–	–	1
Opilo mollis (L.)	AW13	1	–	–	–	1
Dasytes aeratus Steph.		10	–	–	–	10
Axinotarsus marginalis (Lap. de. C.)		22	–	–	–	22
Cerylon histeroides (F.)		–	1	–	–	1
Corticarina similata (Gyll.)		1	–	–	–	1
Cis pygmaeus (Marsh.)		–	57	36	3	96
Orchesia undulata Kraatz	AW13	2	6	–	–	8
Abdera biflexuosa (Curt.)	AW13	–	53	59	2	114
Phloiotrya vaudoueri Muls.	AW13	–	–	5	–	5
Conopalpus testaceus (Ol.)		4	1	–	–	5
Anaspis humeralis (F.)		19	–	–	–	19
A. lurida St.		2	–	–	–	2
A. maculata Fourc.		12	–	–	–	12
Leiopus nebulosus (L.)		3	–	–	–	3
Chaetocnema concinna (Marsh.)		1	–	–	–	1
C. hortensis (Fourc.)		1	–	–	–	1
Apion aeneum (F.)		1	–	–	–	1
Anthonomus pedicularius (L.)		1	–	–	–	1
Curculio glandium Marsh.		1	–	–	–	1
Rhynchaenus pilosus (F.)		12	–	–	–	12
R. quercus (L.)		11	–	–	–	1
Total beetles		125	119	100	9	353
Total species		31	6	3	3	

*AW13 indicates ancient woodland indicator grade 3 (Harding & Rose, 1986).

Six species which did not appear in the first year, emerged in subsequent years. In the case of some of these species, e.g. *Stenagostus villosus*, this was presumably because their larvae take more than one year to develop. Two species with one-year life cycles—*Cis pygmaeus* and *Abdera biflexuosa*—did not appear during the first year but appeared in relatively large numbers in the second and third years. It must be assumed that at least a pair of each emerged undetected in the first year and subsequently bred in the timber while it was in the trap.

The presence of *Ptinus palliatus* among the beetles which emerged from the timber is worthy of special notice. Pope (1988), in recording a single specimen from West Sussex in 1986, was able to cite only four other published records for the beetle this century. It is of interest that one of these referred to three examples found by my friend Mr Allen in an old but living oak tree in Windsor Great Park in 1950 (Allen, 1957). Reference has already been made (Hammond *et al.*, 1989) to the emergence of examples of *Axinotarsus marginalis* from the oak logs as the first indication of a definite breeding habitat for this beetle in Britain.

Comment

The emergence of dead-wood beetles from the timber during this experiment was only to be expected considering its source and underlines the value of preserving such timber as a conservation measure for a period at least. What many managers of wild-life sites want to know, however, is for how long should such fallen timber be preserved. There is often conflict between maintenance of amenity (e.g. tidiness) at a site and conserving habitat and a compromise is often required. On the surface, the findings of this study appear to indicate that such fallen timber comes to have relatively little value as a habitat for beetles after three or four years. It must be remembered, however, that the dead timber in this experiment was no longer accessible to free-flying insects which might otherwise have colonized it and that those beetles which emerged from it were excluded from breeding within the trap the moment they were caught in the collecting head. It must be remembered too, that the present studies relate only to beetles. The answer to this important question clearly requires further study, for example with timber which has been allowed to remain exposed in the field for a year or more and then placed in a trap.

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Emergence traps based on the prototype design can be obtained from Marris House Nets, 54 Richmond Park Avenue, Bournemouth BH8 9DR.

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BOOK REVIEWS

Keys to the insects of the European part of the USSR, Vol. IV, Part II, edited by G. S. Medvedev. Leiden, E. J. Brill, 1990, x + 1092 pp.—As the number of pages indicates this book is a substantial tome. The scope of it is enormous in that it attempts to enable any biologist to key out any lepidopteron from the region if described, right down to the species level. In many ways it is comparable with Meyrick's handbook in its task, but there are a number of significant differences.

The list of families covered needs examining. It does *not* include the more primitive families: Hepialidae to Psychidae in the British list, since these were dealt with (together with the Tortricidae) in Part I. That leaves all the microlepidoptera from Tineidae to Scythrididae, *except* Coleophoridae.

In contrast with Meyrick it is liberally illustrated with line drawings of adults, genitalia, wing-venation, leaf mines etc. These certainly make the book more usable and less intimidating than a purely descriptive key. The other major difference is that it is a collection of chapters by different authors on the various families, with extensive borrowing from earlier publications. There is bound to be a mixture of quality and ease with which the keys can be used with confidence; some will be found excellent, others less than satisfactory.

The book, printed in India, is a translation of the Russian version first published in 1981. Much is out of date already, but that is inevitable in a project on this scale. For many British microlepidopterists this could be a useful book, it will not solve all problems, but some groups are treated more fully here than in publications that are readily available. In addition it alerts us to eastern species which might not yet have been recognized.

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Classification and biology of braconid wasps, by M. R. Shaw and T. Huddleston. Handbooks for the Identification of British Insects volume 7, part 11, London, Royal Entomological Society, 1991, 126 pages, £18, paperback.—If the parasitic hymenoptera are a group overly neglected by entomologists, then the braconid wasps must be amongst the most ignored and under-rated of insects. This handbook comes as a welcome light in the obscurity. As the title of the handbook suggests, this book is slightly away from the main theme of the handbooks in that it does not attempt to offer keys beyond subfamily level and rather focusses on the insects' biology. Each of the 25 subfamilies is treated at length, usually accompanied by a whole-insect figure. The general habits of the subfamily are discussed, with reference to some particularly striking or unusual individual species. For specific identification, the reader is referred to the various other published keys, and the list of references at the back of the book stretches for over 27 pages. Nevertheless, the lack of interest in these fascinating creatures is sadly reflected in the identification note for the first subfamily, the Adeliinae, which reads 'There is at present no basis for reliable identification' and this for a group with only four British species!

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